Name:

at1119paper: Complete the Square, b = odd (v507)

Example

By completing the square, find both solutions to the given equation:

$$x^2 - 47x = -540$$

Add $\left(\frac{-47}{2}\right)^2$, which equals $\frac{2209}{4}$, to both sides of the equation.

$$x^2 - 47x + \frac{2209}{4} = \frac{49}{4}$$

Factor the left side.

$$\left(x + \frac{-47}{2}\right)^2 = \frac{49}{4}$$

Undo the squaring.

$$x + \frac{-47}{2} = \frac{-7}{2} \quad \text{or} \quad x + \frac{-47}{2} = \frac{7}{2}$$
$$x = \frac{47-7}{2} \quad \text{or} \quad x = \frac{47+7}{2}$$
$$x = 20 \quad \text{or} \quad x = 27$$

Question 1

By completing the square, find both solutions to the given equation:

$$x^2 - 35x = 344$$

$$x^2 - 35x + \frac{1225}{4} = \frac{2601}{4}$$
$$\left(x + \frac{-35}{2}\right)^2 = \frac{2601}{4}$$

$$x + \frac{-35}{2} = \frac{-51}{2} \quad \text{or} \quad x + \frac{-35}{2} = \frac{51}{2}$$
$$x = \frac{35-51}{2} \quad \text{or} \quad x = \frac{35+51}{2}$$
$$x = -8 \quad \text{or} \quad x = 43$$

Question 2

By completing the square, find both solutions to the given equation:

$$x^2 - 19x = -70$$

$$x^2 - 19x + \frac{361}{4} = \frac{81}{4}$$

$$\left(x + \frac{-19}{2}\right)^2 = \frac{81}{4}$$

$$x + \frac{-19}{2} = \frac{-9}{2} \quad \text{or} \quad x + \frac{-19}{2} = \frac{9}{2}$$

$$x = \frac{19 - 9}{2} \quad \text{or} \quad x = \frac{19 + 9}{2}$$

$$x = 5 \quad \text{or} \quad x = 14$$

Question 3

By completing the square, find both solutions to the given equation:

$$x^2 - 33x = 720$$

$$x^2 - 33x + \frac{1089}{4} = \frac{3969}{4}$$

$$\left(x + \frac{-33}{2}\right)^2 = \frac{3969}{4}$$

$$x + \frac{-33}{2} = \frac{-63}{2} \quad \text{or} \quad x + \frac{-33}{2} = \frac{63}{2}$$

$$x = \frac{33 - 63}{2} \quad \text{or} \quad x = \frac{33 + 63}{2}$$

$$x = -15 \quad \text{or} \quad x = 48$$